INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.323

Annex G

(02/00)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Infrastructure of audiovisual services – Systems and terminal equipment for audiovisual services

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Packet-based multimedia communications systems

Annex G: Text conversation and Text SET

ITU-T Recommendation H.323 – Annex G

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION H.323

PACKET-BASED MULTIMEDIA COMMUNICATIONS SYSTEMS

ANNEX G

Text conversation and Text SET

Summary

This annex specifies H.323 procedures to establish and carry text conversation sessions in real time over packet networks in the H.323 multimedia environment. It also specifies rules on the use of H.323 that enable Text Conversation Simple Endpoint Type Devices (Text SET) to be created as supersets of the Audio Simple Endpoint type devices specified in Annex F/H.323. The Text SET specification describes a device that can be used for real-time conversations in voice and text simultaneously over packet networks.

Source

Annex G to ITU-T Recommendation H.323 was prepared by ITU-T Study Group 16 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on 17 February 2000.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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The ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. The ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, the ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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PACKET-BASED MULTIMEDIA COMMUNICATIONS SYSTEMS

ANNEX G

Text conversation and Text SET

(Geneva, 2000)

G.1 Introduction

Standardized, character-oriented text conversation facilities are needed in all networks. When building text conversation facilities on multimedia protocols, an opportunity is created to use any combination of text, video and voice in a conversation. The initiative to standardize this combination comes from the needs of people with communication-related disabilities. The availability of the three media in a conversation offers communication opportunities over any one of the media alone. Anyone may find a commonly available, standardized text conversation addition to multimedia conversation services valuable, enhancing videotelephony to "Total Conversation".

Since H.323 is a framework, where components can be included when required, single function text terminals as well as text and voice terminals can be useful subsets of the full Total Conversation terminal. These subsets correspond to text telephones available for the PSTN.

Recommendation T.140 [1] specifies a text conversation protocol. It is a common presentation level suitable for straightforward real-time text conversation in multimedia services and in text telephony. It is based on the ISO 10646-1 character code so as to be suitable to any language. It is introduced throughout the H-series multimedia protocols.

This specification describes how text conversation facilities are added to the H.323 multimedia environment in packet networks.

The text conversation facility is established in a data channel identified by the H.245 OpenLogicalChannel message. The same identification is used for opening text conversation channels in H.324. Only the protocol and procedures of the data channel to carry T.140 data differ.

Thereby, Total Conversation gets a uniform implementation across different networks. The complexity of gateways and other network components can be kept low.

G.2 Scope

The scope of this annex is to specify H.323 procedures to establish and carry text conversation sessions in real time over packet networks in the H.323 multimedia environment. It also specifies rules on the use of H.323 that enable Text Conversation Simple Endpoint Type Devices (Text SET) to be created as supersets of the Audio Simple Endpoint type devices specified in Annex F/H.323. The Text SET specification describes a device that can be used for real-time conversations in voice and text simultaneously over packet networks.

G.3 References

[1] ITU-T Recommendation T.140 (1998), *Protocol for multimedia application text conversation* plus amendment.

[2] HELLSTRÖM (G.): RTP Payload for Text Conversation, RFC 2793, *Internet Engineering Task Force*, 2000.

G.4 Definitions

G.4.1 total conversation: Conversational services offering real-time communication in video, text and voice.

G.4.2 T140PDU: Protocol Data Unit from T.140 = a collection of data submitted in T.140 format for transmission.

G.5 Procedures for opening channels for T.140 text conversation

The session requirements of T.140 are reflected in the following specification for the channel set-up using the H.245 Open Logical Channel Message structure in the H.323 environment.

A reliable or unreliable channel may be selected to carry the T.140 session. The unreliable channel shall always be supported. The unreliable channel may be selected for cases when the terminal is expected to participate in sessions where a reliable channel is unfavourable or impossible to use. The reliable channel is a preferred option.

- In the capabilities exchange, when using a reliable channel, specify:

  DataApplicationCapability.application = t140
  DataProtocolCapability = tcp

- In the capabilities exchange, when using an unreliable channel, specify:

  DataApplicationCapability.application = t140
  DataProtocolCapability = udp

- In the Open Logical Channel procedure, specify:

  OpenLogicalChannel.forwardLogicalChannelParameters = dataType
  DataType = data

  And select a reliable or unreliable channel for the transfer of T.140 data by specifying the **DataApplicationCapability** and the **DataProtocolCapability** as above.

The fast-start or the normal procedures may be used.

The destination node and originating node concepts of Recommendation T.140 are mapped to the two H.323 endpoints.

The T.140 user identity is an alias for the far H.323 endpoint.

G.6 Framing and buffering of T.140 data

Transmission of T.140 data shall be done according to the following specifications, different for the reliable and the unreliable channel.

G.6.1 Common considerations

T.140 data may be collected in a buffer before transmission in the channel. On low bit-rate channels, such buffering is recommended in order to reduce packet overhead. Buffering of data in 0.3-second intervals is recommended as default.

On reception, the data contents of the data channel is retrieved and used as T.140 data.

G.6.2 Usage of reliable channels

When a reliable channel is selected for T.140 transmission, TCP is used, and T.140 data is transmitted in the channel without further framing.

G.6.3 Usage of unreliable channels

When an unreliable channel is specified for the T.140 transmission, RTP is used. The details of the RTP payload format "T140" is found in [2]. The recommended procedures described in [2] should be used. The payload type allocation is dynamic. For the plain "T140" payload format, Payload Type 96 is used. For the payload type "RED" with redundancy, Payload Type 98 is used.

The procedures offer the possibility to include a number of already transmitted T140PDUs in the packet. This is done in order to include redundant data to reduce the risks of data loss.

The transmitting station may select a number of T.140 PDU generations to retransmit in each packet. A higher number introduces better protection against loss of text. If network conditions are not known, it is recommended to use two generations. It is recommended to use not more than six generations.

RTCP should be used to monitor packet loss, so that a decision can be made on the number of generations of redundant data to transmit.

G.7 Interaction with text conversation facilities in other devices

The information in this subclause is not normative and is provided for information only, beyond the scope of this annex.

Recommendation T.140 is established as the text conversation protocol throughout a series of H-series multimedia protocols, T.120 data conferencing and for ITU-T V.18 text telephones. The data channels are specific to each environment.

When gateways to these different environments are established, the T.140 channel in the H.323 environment is mapped into the T.140 channel in the other environment. The T.140 channel data can be transparently transferred through the gateway.

When gateways to other text conversation protocols are established, the data and protocol mechanisms of that protocol shall be mapped into a T.140 text conversation channel in the gateway. Such mapping functions can be called T.140 equalizers. Gateway functions to the different text telephone systems involve T.140 equalizers.

Figure 1 gives an overview of text conversation protocols and gateway services.

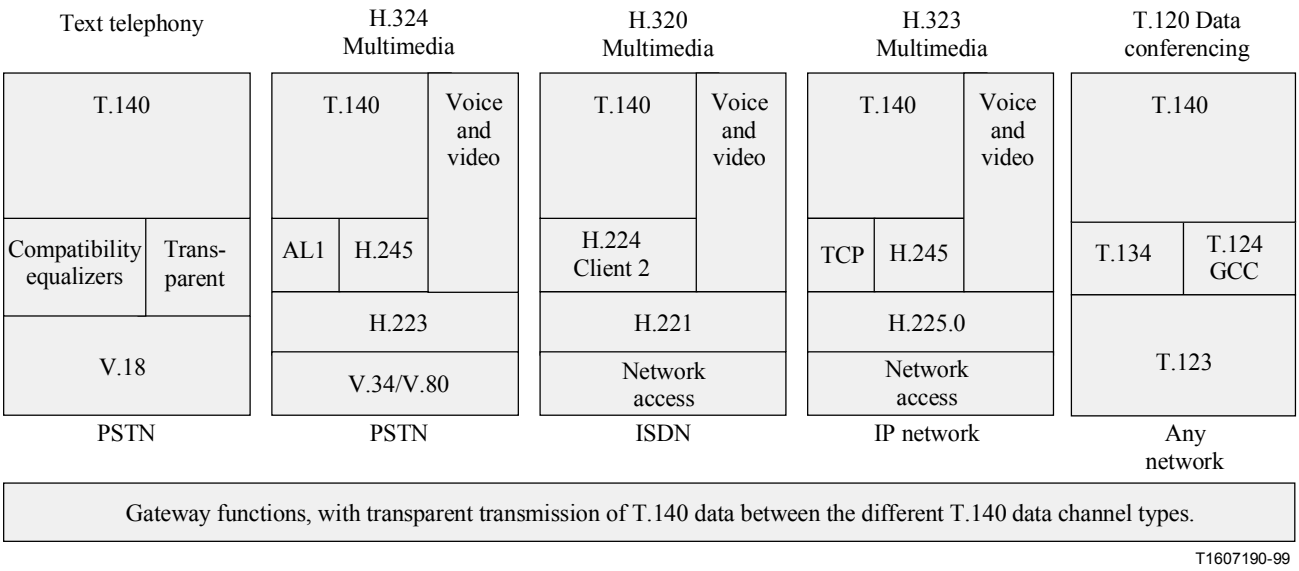

Figure G.1/H.323 – Multimedia real-time text conversation Recommendations and interworking needs

G.8 Multipoint considerations

Without further specification, three alternative options exist for H.323 endpoints with T.140 text conversation to participate in multipoint text conversations.

Alternatives:

- One separate T.140 channel is set up for each remote H.323 endpoint. The text streams can be coordinated for display through a multipoint-aware user interface, that also transmits T.140 data to all connected endpoints.
- An MCU coordinates the T.140 data stream to the H.323 endpoint to contain data from a number of remote endpoints.
- Instead of the procedures described in this annex, the T.134 application member of T.120 data conferencing is used as the channel for T.140 data. Multipoint sessions are coordinated through the T.120 concepts.

G.8.1 Situations for multipoint text conversation

In order to clarify the use of text conversation, and especially the different multipoint cases, the following examples of possible setups and applications are given without being normative.

G.8.1.1 One-to-one

The one-to-one case represents a direct conversation in text between two parties, where the text entered at one endpoint is displayed character by character or in small groups of characters as they are entered at the other end. Typical examples are situations like the traditional text telephony in PSTN and multimedia conversation applications with video, text and data used for person-to-person calls.

Anne	Eve
Hi, this is Anne.	
	Oh, hello Anne, I am glad you are calling!
Have you heard that I will come to Paris in November?	
	No, that was new to me. What brings you here?

Figure G.2/H.323 – Possible display of a one-to-one text call

G.8.1.2 Many-to-many

All users have write permission, forming an unmanaged conference.

The display can be arranged as specified in Recommendation T.140 with one window for each participant.

Anne	Eve
Hi, this is Anne. Have you heard that I will come to Paris in November?	Oh, hello guys! How are you Steve?
Steve	**Bill**
Hi there! This is Steve, I'm fine.	Hello Anne! I am happy that you are on the big Internet!

Figure G.3/H.323 – Possible display of an unmanaged four-to-four text session

The display of a many-to-many conference can also be ordered in one window with labels for each participant's entries (IRC style):

```
Steve> Hi there!
Anne> Have you heard that I will come to Paris in November?
Bill> Hello Anne! I am happy that you are on the big Internet!
Eve> Oh, hello guys! How are you Steve?
Steve> I'm fine.
```

Figure G.4/H.323 – Possible display of an unmanaged four-to-four text session IRC style

G.8.1.3 One-to-many with managed right to type

One writer at a time is given the right to transmit text to many readers. The right to type may be passed to other writers, in a managed meeting.

Typical application is in distance education when the teacher normally has the right to type, but can hand it over to a participant.

G.8.1.4 One-to-many with fixed right to type

One writer types text in the session from one fixed endpoint, the other endpoints display the text in a receiving window. The right to write cannot be transferred.

Typical application is found in subtitled speeches.

The user terminals may be H.332 loosely coupled endpoints.

We are proud to announce today a new superior system for intergalactic travel

Figure G.5/H.323 – Example of one-to-many text session

G.9 Text SET: Text Conversation Simple Endpoint Type

This part of the annex specifies Text Conversation Simple Endpoint Type Devices that operate using a well-defined subset of H.323 protocols. They are well suited for IP Text Telephony applications while retaining the interoperability with regular H.323 Version 2 (1998) devices. The specification adds real-time text conversation facilities as specified in Recommendation T.140 to the simple IP-voice telephone as specified in Annex F/H.323, to form the IP-text telephone with simultaneous voice and text functionality.

G.9.1 Introduction to Text SET

The procedural and protocol details of a Simple Endpoint Type Text Telephone Device for IP networks is defined in terms of modifications and additions to the Audio SET specification found in Annex F/H.323. The device here is called Text SET.

The general SET concepts are described in Annex F/H.323. This is a set of modifications to the Audio SET specification that comprises what is needed to add text conversation functionality to the Audio SET. This annex indicates the subclause numbers of the original.

G.9.2 Text SET System Functionality Overview (F.6/H.323)

In **Media capabilities**; modify:

- Data-capability mandatory; T.140.

G.9.3 Procedures for Text SET devices (F.7/H.323)

Modify the Media packetization and transport to:

- Media packetization and transport (H.225.0, RTP, TCP, T.140) – See F.7.4/H.323;

G.9.4 RAS Signalling (H.225.0 RAS – F.7.1/H.323)

As for Audio SET, but a SET H.225.0 endpoint type code booked for Text SET is used.

Bit 2: =1 Indicates that the device has Text SET capabilities.

Bit 2: =0 Indicates that the device has no Text SET capabilities.

NOTE – The Gatekeeper protocols must be designed so that they will allow voice-only sessions with a Text SET device.

G.9.5 Call Signalling (H.225.0 Call Control – F.7.2/H.323)

SET H.225.0 endpoint type code bit 2 is used to indicate a Text SET function.

G.9.6 Data Capability (F.7.3.3.3/H.323)

Data capability T.140 shall be specified.

DataApplicationCapability.application = t140.

G.9.7 Additional rules for usage of capabilities (F.7.3.3.9/H.323)

Audio and data capabilities shall only be signalled via the FastConnect procedure and repeated exchange of OpenLogicalChannel structures using the FastConnect.

Video capabilities, conference capabilities, security capabilities, and h233 encryption capabilities shall not be used.

The values of the MultiplexCapability table entry shall be assumed as for Audio SET with the following exceptions:

mediaDistributionCapability
centralizedDataTRUE
distributedDataTRUE/FALSE as appropriate, default FALSE

G.9.8 Logical Channel Signalling Messages (F.7.3.4/H.323)

Add in the OpenLogicalChannel request.

OpenLogicalChannel.forwardLogicalChannelParameters.DataType.data = t140
MultiplexParameters as appropriate for the selected reliable or unreliable channel type.

G.9.9 Media Exchange (F.7.4/H.323)

For text exchange, SET terminals shall follow the procedures specified in this annex.

G.9.10 Initiating side (F.7.6.1/H.323)

Add:

The OpenLogicalChannel structure should offer the same data encoding for text that were offered in the initial call.

G.9.11 Conference-unaware Text SET terminals (F.7.7.1/H.323)

Add the following functionality points:

- Merging several incoming text sessions to the Text SET device.
- Translating the transport addresses for the text stream.
- Transferring and possibly transcoding text data streams.

G.9.12 Support for Loosely-coupled Conferences (Recommendation H.332) (F.7.8/H.323)

A Text SET device can participate in a Loosely-coupled Conference using the H.332 procedures provided that the conference is expanded to include text, and that the channel for text transmission is selected to use an unreliable channel.

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Geneva, 2000